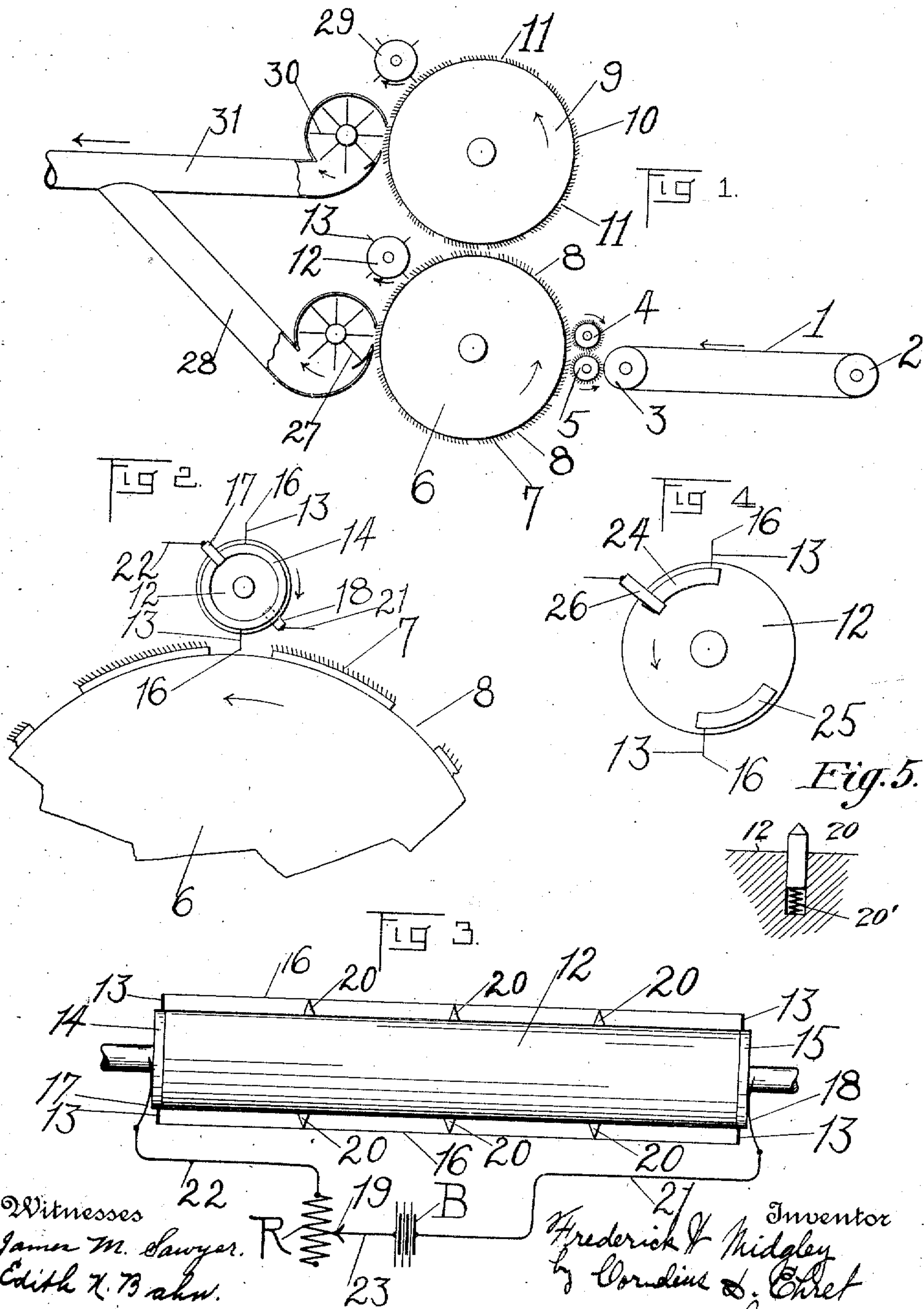


No. 848,039.

PATENTED MAR. 26, 1907.

F. W. MIDGLEY.
SILK RECLAIMING MACHINE.

APPLICATION FILED DEC. 27, 1904.



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FREDERICK W. MIDGLEY, OF JERSEY CITY, NEW JERSEY.

SILK-RECLAIMING MACHINE.

No. 848,039.

Specification of Letters Patent.

Patented March 26, 1907.

Application filed December 27, 1904. Serial No. 238,279.

To all whom it may concern:

Be it known that I, FREDERICK W. MIDGLEY, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Silk-Reclaiming Machines, of which the following is a specification.

My invention relates to a machine for reclaiming waste silk either in fibrous, thrown, or thread form, the purpose being to straighten out the fibers or threads and to cut them into practically uniform lengths suitable for respinning into any desired textile yarn.

My invention resides also in means for performing the cutting operation, and consists of a wire or other means, of platinum or other suitable material, heated electrically or in other manner.

For an illustration of one of the numerous forms which my invention may take reference is to be had to the accompanying drawings, in which—

Figure 1 is a side elevational view, partly in section, of the more essential elements of the machine. Fig. 2 is an end elevation, on larger scale, showing the cutting apparatus. Fig. 3 is a longitudinal elevation of the cutting mechanism. Fig. 4 is an elevational view of a modified form of cutting mechanism. Fig. 5 is a fragmentary sectional view of the cylinder 12, showing the mounting of a support 20 or of a post 13.

In Fig. 1, 1 is a feed-apron traveling in the direction of the arrow and driven by and running upon the cylinders 2 and 3. 4 and 5 constitute a pair of feed-rolls carrying upon their peripheries metallic teeth for grasping the material fed by the apron 1 and retarding or controlling its passage to the cylinder 6. This cylinder 6 carries on its periphery sections of card-clothing, the several sections being separated by slight intervals, as 8, to permit the cutting of the fibers or threads, as hereinafter described. 9 is another roller or cylinder similar to 6 and provided with card-clothing 10, such card-clothing being divided into sections and separated by intervals, as 11. At 12 is shown a cylinder which supports upon its periphery one or more platinum or other conductors maintained at sufficiently high temperature by an electric current or other suitable means. Such platinum

conductors extend lengthwise of the cylinder and are stretched between conducting-posts 13. This cylinder 12 is geared to the cylinder 6, so that their relative rates of rotation remain constant. The intervals 8 between the sections of card-clothing, the spacing of the posts on the cylinder 12, and the rate of rotation of the cylinder 12 is such that a heated wire or other instrumentality is inserted into each interval 8 as the cylinder 6 rotates.

Referring also to Figs. 2 and 3, 14 and 15 represent metallic rings located upon the ends of the cylinder 12, such cylinder being preferably of non-conducting material. The posts 13 13 are supported either in the cylinder 12 and electrically connected with the end rings 14 and 15 or such posts 13 13 may be secured directly to the metallic rings 14 and 15. Between the posts 13 13 is stretched a suitable wire 16, such as platinum or other suitable infusible material. Such wire 16 may consist of a cheap metallic core surrounded by a coating of platinum or other suitable infusible material. Bearing upon the end ring 14 is a brush 17 and bearing upon the end ring 15 is a brush 18. B is a suitable source of electrical energy, and R is a suitable resistance, more or less of which may be cut into and out of circuit by the moving contact 19, thus adjusting to a nicety the temperature of the wires 16 16.

Since it is desirable to consume as little electrical or other energy as possible for maintaining the wires 16 16 at sufficiently high temperature and since it is also desirable that the wire 16 16 should have considerable strength when at such temperature to withstand the pressure of the material through which they are to burn their way, the wires 16 16 may be made of conductor of relatively small diameter, which will then require less electrical energy to heat to the required temperature, and supports 20 of non-infusible non-heat-conducting material—such as lava, for example—are secured to the cylinder 12 and support the wires 16 16. The extent of contact between the supports 20 20 and the wires 16 16 should be as small as possible, so that the wires 16 16 may not be cooled to too low a temperature at these points of support. The path of the current, as viewed in Fig. 3, is from the source of electrical energy B, through the

conductor 21 to the brush 18, thence through the end ring 15 to the posts 13 13, thence through the wires 16 16 to the posts 13 13, thence through the end ring 14 to the brush 17, through conductor 22, thence through resistance R, movable contact 19, conductor 23, to the source B. As here shown, the several wires 16 16 are connected in parallel with each other; but it is to be understood that they may be connected in series with each other, if desired. It is also a fact that the wires 16 16, Fig. 3, are always in circuit and are therefore always consuming electrical energy even while in such position as to perform no cutting operation. To obviate this disadvantage, the arrangement may be such as shown in Fig. 4. Here the cylinder 12 carries on each end contact-segments 24 and 25, one for each cutting-wire. A brush 26 is provided similarly to brush 17 or brush 18 and serves to contact with the plates 24 and 25 consecutively, thus cutting wire 16 into circuit a few moments before it is to perform its cutting operation, thus giving it time to be raised to the required temperature and cutting it out of circuit immediately after the cutting operation has been performed, with a resultant saving in electrical energy.

The operation is as follows: The waste silk in fibrous, thrown, or thread form in tangled and knotted masses and of various lengths is fed by the apron 1 into the feed-rolls 4 and 5. The teeth on these rolls grasp the material and prevent its passing to the roller 6 at anything higher than a definite rate. The roller 6 has a peripheral speed greater than the peripheral speed of the feed-rolls 4 and 5 and tears away from the feed-rolls 4 and 5 the silk which passing through them. This operation tends to straighten out the silk upon the periphery of the roller 6, the straightened portions lying at the roots of the card-clothing, while knotted and tangled masses are also carried around by the roller 6, and such portions as extend above the card-clothing on the roller 6 are taken up by the card-clothing 10 on the roller 9. It is to be noted that the card-clothing 7 of the roller 6 travels in an opposite direction to the card-clothing 10 on the roller 9 where they come closest to each other. The action of the cylinder 9 is to remove all knots, kinks, and tangles and to straighten out the fibers or threads on both the cylinders 6 and 9. The fibers or threads being now straightened out upon both cylinders 6 and 9, the material on the roller 6 is carried around in front of the cylinder 12 and the several platinum wires 16 on said cylinder 12 are rotated and pass between the sections of card-clothing into the spaces 8, thus coming in contact with the straightened fibers or threads and burning them through, thus, in fact, cutting the material into approximately uniform lengths,

which lengths may be made whatever desired by suitably spacing the intervals 8 in the card-clothing and by properly gearing the cylinder 12. After the material on the roller 6 has been cut into the desired lengths it is carried around past the rotating brush-wheel 27, bristle brushes being carried at the outer extremities of the blades of the wheel, such blades operating also as fan-blades to cause a current of air in the conduit 28, such current of air transporting the lengths of fiber or thread to other apparatus. Similarly the straightened material on the roller 9 is carried around to the cylinder 29, which similarly to the cylinder 12 carries wires heated in the same manner and operating in the same manner to cut the material. The material is then brushed off, as in the case of the wheel 27, by the wheel 30, which serves also to cause a current of air in the conduit 31, such current of air serving to carry off the material for further treatment or operation. In the case that silk threads are carried off in the conduits 28 and 31 such threads may be separated again into fibers by garneting or carding, and after the material is in the state of fibers of approximately uniform lengths may be combed and spun into any suitable textile yarn.

It is to be understood that not only may silk be treated in the manner herein described, but that any other material may be so treated to reclaim waste.

It is also to be understood that the posts 13 13, between which are stretched the wires 16 16, may be mounted so as to reciprocate radially with respect to the cylinder 12, to thus permit the wires 16 16 to be relieved from great pressure by the silk or material under treatment when such material forms a relatively heavy mass extending across the intervals 8 or 11 in the card-clothing on the rollers 6 and 9. The supports 20 may also be mounted to thus reciprocate radially, as shown in Fig. 5. In the case of both the posts 13 13 and the supports 20 spiral springs 20' or other suitable resilient material may oppose this radial motion.

In place of using wires 16 16 heated electrically other suitably heated means may be employed and rotated to thus separate the material into practically uniform lengths.

A second pair of feed-rolls similar to 4 and 5 may be placed between the cylinder 6 and feed-rolls 4 and 5.

It is obvious also that the fibrous material may be severed by other means than burning—as, for example, by applying a chemical agent to the material at the point where it is desired to sever the same, such agent destroying the material where applied.

What I claim is—

1. In combination, a plurality of sections of card-clothing disposed at practically uniform intervals, and means adapted to cut the

material held by said card-clothing, said means comprising a heated member, and means for moving said heated member into an interval between sections of card-clothing whereby the material is severed.

2. In combination, a plurality of sections of card-clothing disposed at practically uniform intervals, a heated member, and means for moving said member into an interval between sections of card-clothing, whereby the material held by said card-clothing is severed.

3. In combination, a plurality of sections of card-clothing disposed at practically uniform intervals, a heated member, means for moving said member into an interval between sections of card-clothing, and means for passing a current of electricity through said member to heat the same, whereby the material held by said card-clothing is severed.

4. In combination, a plurality of sections of card-clothing disposed at intervals, a heated member, and means for moving said member into an interval between sections of card-clothing, whereby the material held by said card-clothing is severed.

5. In combination, card-clothing for operating upon fibrous material, a heated member, and means for operating said member to bring the same into proximity to or contact with said material, whereby said material is severed.

6. In combination, a cylinder, card-clothing disposed upon the periphery of said cylinder for operating upon fibrous material, a heated member, and means for periodically bringing said member into proximity to or contact with the material held by said card-clothing, whereby said material is severed.

7. In combination, a cylinder, card-clothing disposed upon the periphery of said cylinder for operating upon fibrous material, a heated member, means for heating said member by electrical energy, and means for bringing said member into proximity to or contact with said material, whereby said material is severed.

8. In combination, a cylinder, sections of card-clothing disposed at intervals upon its periphery, a heated member, and means for moving said member into an interval between sections of card-clothing, whereby the material held by said card-clothing is severed.

9. In combination, a cylinder, sections of card-clothing disposed at intervals upon the periphery thereof, a wire, means for electrically heating said wire, and means for moving said wire into an interval between sections of

card-clothing, whereby the material held by said card-clothing is severed.

10. In combination, a cylinder, sections of card-clothing disposed at intervals upon the periphery thereof, a cooperating cylinder, a heated member carried by said cooperating cylinder, said cooperating cylinder being adapted to rotate said heated member to move the same into an interval between sections of card-clothing, whereby the material held by said card-clothing is severed.

11. In combination, a cylinder, sections of card-clothing disposed at intervals upon the periphery thereof, a cooperating cylinder, a heated member carried thereby, means for passing an electric current through said member to heat the same, said cooperating cylinder being adapted to move said heated member into an interval between sections of card-clothing, whereby the material held by said card-clothing is severed.

12. In combination, a rotating cylinder, sections of card-clothing disposed at intervals upon the periphery thereof, a cooperating cylinder, heated members carried thereby, said cooperating cylinder being adapted to move said heated members in succession into intervals between sections of card-clothing, whereby the material held by said card-clothing is severed into desired lengths.

13. In combination, a cylinder, sections of card-clothing disposed at intervals upon the periphery thereof, a cooperating cylinder, a plurality of wires supported thereby, means for passing electric current through said wires to heat the same, said cooperating cylinder being adapted to move said wires in succession into intervals between sections of said card-clothing, whereby the material held by said card-clothing is severed.

14. In mechanism for operating upon fibrous materials, a cylinder, a conductor thereon, yielding supports for said conductor, and means for passing an electric current through said conductor to heat the same.

15. In mechanism for operating upon fibrous materials, a cylinder, supports thereon, resilient means permitting movement of said supports with respect to said cylinder, a conductor carried by said supports, and means for passing an electric current through said conductor to heat the same.

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